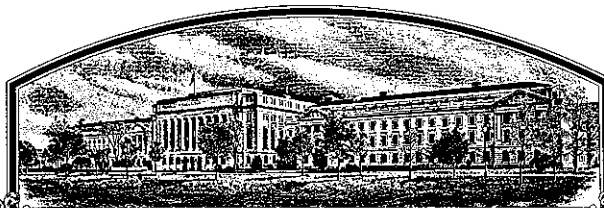


No.



8400111

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The Standard Oil Company

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (T. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'SX-4-21'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 31st day of October in the year of our Lord one thousand nine hundred and eighty-six.

Attest:

Kenneth H. Evans
Commissioner
Plant Variety Protection Office
Livestock, Meat, Grain & Seed Division
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
WAREHOUSE & SEED DIVISION

APPROVAL EXPIRES 4-30-85

FORM APPROVED: OMB NO. 0581-0055

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

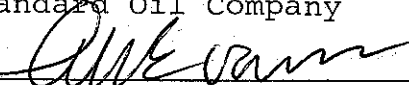
1. NAME OF APPLICANT(S) The Standard Oil Company		2. TEMPORARY DESIGNATION X-4-21		3. VARIETY NAME SX-4-21 ^{RFS} 1/29/86	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) Midland Building (928TT) Cleveland, Ohio 44115		5. PHONE (Include area code) (216) 575-8460		FOR OFFICIAL USE ONLY PVPO NUMBER 8400111	
6. GENUS AND SPECIES NAME Zea Mays		7. FAMILY NAME (Botanical) Gramineae		FILING DATE 5/25/84 TIME 2:30 <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M.	
8. KIND NAME Corn		9. DATE OF DETERMINATION December 1981		FEES RECEIVED AMOUNT FOR FILING \$ 1,800 DATE 5/25/84 AMOUNT FOR CERTIFICATE \$ 200.00 25.00 DATE September 17, 1986	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation				12. DATE OF INCORPORATION January 10, 1870	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Ohio				13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Charles E. Lipsey or Geoffrey M. Karny Finnegan, Henderson, Farabow, Garrett & Dunner 1775 K Street, N.W. Washington, D.C. 20006 PHONE (Include area code): (202) 293-6850	
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED					
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.) b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.) d. <input type="checkbox"/> Exhibit D, Additional Description of the Variety X Exhibit E, Statement of Basis of Ownership					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No ^{RFS 9/17/86}					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input type="checkbox"/> No		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified			
18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN OFFERED FOR SALE OR MARKETED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT The Standard Oil Company By  Larry W. Evans Manager, Patent & License Division				DATE May 10, 1984	

Exhibit A: Origin and Breeding History of Corn Variety ~~X-4-21~~ ^{'SX-4-21' r/s}

^{'SX-4-21'}
~~X-4-21~~ originated out of Dudley and Alexander's "Synthetic B." The breeding method for obtaining Synthetic B is described in J. W. Dudley and D. E. Alexander, Crop Science, 9:613-615, 1969. Original breeding stock was obtained from the University of Illinois in May, 1980.

The seeds of Synthetic B were planted in May of 1980 and self-pollinations were made on the most robust plants during the summer of 1980. Self-pollinated seed from these plants were bulked and selfed in the winter of 1980-81, winter of 1981-82, winter of 1982-83, and summer of 1983. Ears were kept separate from the summer 1983 planting, and an ear-to-row planting was made during the winter of 1983-84. Acceptable uniformity was observed.

^{'SX-4-21'}
Outline of the Development of ~~X-4-21~~

<u>Type</u>	<u>Description</u>	<u>Location</u>	<u>Year</u>
Synthetic B	Self-pollination	Ohio, Illinois	1980
4	Self-pollination	Florida	1980-81
4	Self-pollination	Florida	1981-82
4	Self-pollination	Florida	1982-83
4	Self-pollination	Indiana	1983
X-4-21	Self-pollination	Florida	1983-84

'SX-4-21'

Addendum to Exhibit A for Corn Variety X-4-217

One generation was judged for uniformity and stability.
There were no discernible variants.

Exhibit B: Novelty Statement

'SX-4-21' Rfs

<X-4-21> is a tetraploid Zea maize ssp. maize. Unlike diploid corn, ^{'SX-4-21'}<X-4-21> has twice the normal number of chromosomes, that is, it has 40 somatic chromosomes. Normal Zea maize ssp. maize is diploid, and has 20 somatic chromosomes. Therefore, ^{'SX-4-21'}<X-4-21> is unique on the basis of its number of somatic chromosomes, and differs from all diploid corn on this basis.

'SX-4-21'

<X-4-21> differs from Synthetic B on the basis of its uniformity and homozygosity. Synthetic B is a very heterogeneous population, as demonstrated by the fact that the Applicant has derived a number of novel varieties from Synthetic B.

'SX-4-21' Rfs

<X-4-21> differs from other tetraploid inbred lines of corn on the basis of the characteristics given in Exhibit C.

8400111

'SX-4-21'

Addendum to Exhibit B for Corn Variety <X-4-21>

R/S
1/29/86

The only other tetraploid varieties of which the applicant is aware are those developed by the applicant itself. <X-4-21> may be compared to and distinguished from tetraploid varieties SX-4-5, SX-4-4, and SX-4-33-4-2, for which applications for plant variety protection certificates have been filed and assigned application numbers 8400115, 8400116, and 8500047, respectively.

'SX-4-21'

<X-4-21> differs from:

'SX-4-5' on the basis of:

plant height (Florida)	(147 cm vs 128 cm)
leaf color	(3 vs 2)*
tassel branch number	(9 vs 4 88 R/S 12/18/85)
husk color	(2 vs 4)

'SX-4-4' on the basis of:

plant height (Ohio)	(253 cm vs 228 cm)
leaf color	(3 vs 1)
leaf length	(62 cm vs 72 cm)
tassel branch number	(1 vs 3)
glume color	(2 vs 1)

'SX-4-33-4-2' on the basis of:

plant height (Florida)	(147 cm vs 133 113 cm) R/S
tiller number	(1 vs 2)
tassel branch number	(9 vs 15)
anther color	(1 vs 2)

* The numbers refer to those listed for the specified characteristics on the Objective Description of Variety (Exhibit C) in the application for each of the identified varieties.

Amendment to Exhibit B for Corn Variety ^{'SX-4-21'}<X-4-21>
(Application No. 8400111)

r/s
1/29/86

^{'SX-4-21'}

Please amend Exhibit B to show that <X-4-21> differs from
'SX-4-5' on the basis of tassel branch number (9 vs 6) and differs
from 'SX-4-33-4-2' on the basis of plant height (Florida) (147 cm vs
113 cm).

FORM GR-470-28
(2-15-74)UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782EXHIBIT C
(Corn)OBJECTIVE DESCRIPTION OF VARIETY
CORN (ZEA MAYS)Revised
SX-4-21

NAME OF APPLICANT(S)

The Standard Oil Company

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

200 Public Square, 36-F-3454
Cleveland, Ohio 44114-2375

FOR OFFICIAL USE ONLY

PVPO NUMBER

8400111

VARIETY NAME OR TEMPORARY
DESIGNATIONPlace the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. or) when number is either 99 or less or 9 or less.

1. TYPE:

1 = SWEET

2 = DENT

3 = FLINT

4 = FLOUR

5 = POP

6 = ORNAMENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

1 = NORTHWEST

2 = NORTHCENTRAL

3 = NORTHEAST

4 = SOUTHEAST

5 = SOUTHCENTRAL

6 = SOUTHWEST

7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "omments" (pg. 3) state how
heat units were calculated)

DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK

HEAT UNITS

DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY

HEAT UNITS

DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE

HEAT UNITS

4. PLANT:

- Ohio

CM. HEIGHT (To tassel tip)

Florida

CM. LENGTH OF TOP EAR INTERNODE

 - Ohio

CM. EAR HEIGHT (To base of top ear)

Florida

Number of Tillers:

1 = NONE

2 = 1-2

3 = 2-3

4 = > 3

Number of Ears Per Stalk:

1 = SINGLE

2 = SLIGHT TWO-EAR TENDENCY

3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

1 = NORMAL

2 = "T"

3 = "S"

4 = "C"

5 = OTHER (Specify)

5. LEAF (Field Corn Inbred Examples Given):

Color:

1 = LIGHT GREEN (HY)

2 = MEDIUM GREEN (WF9)

3 = DARK GREEN (B14)

4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

1 = < 30°

2 = 30-60°

3 = > 60°

Sheath Pubescence:

1 = LIGHT (W22)

2 = MEDIUM (WF9)

3 = HEAVY (OH26)

Marginal Waves:

1 = NONE (HY)

2 = FEW (WF9)

3 = MANY (OH7L)

Longitudinal Creases:

1 = ABSENT (OH51)

2 = FEW (OH56A)

3 = MANY (PA11)

Width:

CM. WIDEST POINT OF EAR NODE LEAF

Length:

CM. EAR NODE LEAF

NUMBER OF LEAVES PER MATURE PLANT

7

6. TASSEL:

NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

1 = $< 30^\circ$ 2 = $30-40^\circ$ 3 = $> 45^\circ$

Penduncle Length:

CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

1 = LIGHT (WF9)

2 = MEDIUM

3 = HEAVY (KY21)

Anther Color:

1 = YELLOW

2 = PINK

3 = RED

4 = PURPLE

5 = GREEN

Glume Color:

6 = OTHER (Specify) _____

Ring Color

Pollen Restoration for Cytoplasm (0 = Not Tested, 1 = Partial, 2 = Good)

"T"

"S"

"C"

OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

CM LENGTH

MM. MID-POINT
DIAMETER

GM. WEIGHT

Kernel Rows:

1 = INDISTINCT

2 = DISTINCT

NUMBER

1 = STRAIGHT

2 = SLIGHTLY CURVED

3 = SPIRAL

Silk Color (Exposed at Silking Stage):

1 = GREEN

2 = PINK

3 = SALMON

4 = RED

1 - Internal Silk Color

Husk Color:

FRESH

1 = LIGHT GREEN

2 = DARK GREEN

3 = PINK

DRY

4 = RED

5 = PURPLE

6 = BUFF

Husk Extention: (Harvest Stage)

1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)

3 = LONG (8-10CM Beyond Ear Tip)

4 = VERY LONG (> 10 CM)

Husk Leaf:

1 = SHORT (< 8 CM)

2 = MEDIUM (8-15 CM)

3 = LONG (> 15 CM)

Shank:

CM LONG

NO. OF INTERNODES

Position at Dry Husk Stage:

1 = UPRIGHT

2 = HORIZONTAL

3 = PENDENT

Taper:

1 = SLIGHT

2 = AVERAGE

3 = EXTREME

Drying Time (Unhusked Ear):

1 = SLOW

2 = AVERAGE

3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

MM LONG

MM. WIDE

MM. THICK

Shape Grade (% Rounds)

1 = < 20

2 = 20-40

3 = 40-60

4 = 60-80

5 = > 80

8. KERNEL (Dried) :

Pericarp Color:

1 = COLORLESS

2 = RED-WHITE

3 = TAN

4 = BRONZE

5 = BROWN

6 = LIGHT RED

7 = CHERRY RED

8 = VARIEGATED (Describe) bronze & yellow

Aleurone Color:

1 = HOMOZYGOUS

2 = SEGREGATING (Describe) _____

1 = WHITE

2 = PINK

3 = TAN

4 = BROWN

5 = BRONZE

6 = RED

7 = PURPLE

8 = PALE PURPLE

9 = VARIEGATED (Describe) _____

Endosperm Color:

1 = WHITE

2 = PALE YELLOW

3 = YELLOW

4 = PINK-ORANGE

5 = WHITE CAP.

Endosperm Type:

1 = SWEET (su1)

2 = EXTRA SWEET (sh2)

3 = NORMAL STARCH

4 = HIGH AMYLOSE STARCH

5 = WAXY STARCH

6 = HIGH PROTEIN

7 = HIGH LYSINE

8 = OTHER (Specify) _____

GM. WEIGHT /100 SEEDS (Unsize Sample)

9. COB:

MM. DIAMETER AT MID-POINT

Strength:

1 = WEAK

2 = STRONG

Color:

1 = WHITE

2 = PINK

3 = RED

4 = BROWN

5 = VARIEGATED

6 OTHER (Specify) _____

10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

STALK ROT (Diplodia)

STALK ROT (Fusarium)

STALK ROT (Gibberella)

NORTHERN LEAF BLIGHT

SOUTHERN LEAF BLIGHT

SMUT

SOUTHERN RUST

CORN SMUT

BACTERIAL WILT

BACTERIAL LEAF BLIGHT

MAIZE DWARF MOSAIC

STUNT

OTHER (Specify) _____

11. INSECT RESISTANT (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

CORNBORER

EARWORM

SAPBEETLE

APHID

ROOTWORM (Northern)

ROOTWORM (Western)

ROOTWORM (Southern)

OTHER (Specify) _____

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity		Kernel Type	
Plant Type		Quality (Edible)	
Ear Type		Usage	

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 - A System for the Classification of Corn Inbred Lines - PhD. Thesis, Ohio State University.

COMMENTS:

Exhibit E: Statement of the Basis of Applicant's Ownership

The Standard Oil Company is the employer of the plant breeder involved in the development of ^{'SX-4-21'} X-4-21. The Standard Oil Company has sole rights to and ownership of ^{'SX-4-21'} X-4-21.

ASSIGNMENT

WHEREAS, I, STEVEN CHANDLER PRICE, a citizen of the United States of America, residing at 21210 Clare Avenue, Maple Heights, Ohio 44137, as assignor, have developed a novel plant variety designated Corn<X-4-21> and ^{R/S 1/29/86}
SX-4-21

WHEREAS, THE STANDARD OIL COMPANY, a corporation organized and doing business under the laws of the State of Ohio, whose post office address is Midland Building, Cleveland, Ohio 44115, as assignee, is desirous of securing the entire right, title, and interest in and to this novel plant variety in all countries throughout the world;

NOW THEREFORE, be it known that for and in consideration of the sum of One Dollar (\$1.00) in hand paid and other good and valuable consideration the receipt of which from assignee is hereby acknowledged, I, as assignor, have sold, assigned, transferred, and set over, and do hereby sell, assign, transfer, and set over unto the assignee, its lawful successors and assigns, my entire right, title and interest in and to this novel plant variety designated CornSX-4-21 and improvements thereof, the so-designated Application for United States Certificate of Plant Variety Protection, which was executed on May 10, 1984 by assignee, and all Certificates of Plant Variety Protection of the United States which may be granted thereon, and all reissues, continuations, extensions, or renewals thereof, and all rights to claim priority on the basis of such application, and all applications for Certificates of Plant Variety Protection or applications for similar rights, however denominated, which may hereafter be filed for this novel plant variety in any foreign country and all Certificates of Plant Variety Protection or other rights which may be granted on this novel plant variety in any foreign country, and all extensions, renewals, and reissues thereof; and I hereby authorize and request the Secretary of Agriculture of the United States and any official of any foreign country whose duty it is to issue certificates on applications as described above, to issue all Certificates of Plant Variety Protection or other rights for this novel plant variety to assignee, its successors and assigns in accordance with the terms of this Assignment;

AND, I HEREBY covenant that I have the full right to convey the interest assigned by this Assignment, and I have not executed and will not execute any agreement in conflict with this Assignment;

AND, I HEREBY further covenant and agree that I will, without further consideration, communicate with assignee, its successors and assigns, any facts known to me respecting this novel plant variety, and testify in any legal proceeding, sign all lawful papers when called upon to do so, execute and deliver any and all papers that may be necessary or desirable to perfect the title to this novel plant variety in said assignee, its successors and assigns, make all rightful oaths and generally do everything possible to aid assignee, its successors and assigns to obtain and enforce proper certificate protection for this novel plant variety in the United States and any foreign country, it being understood that any expense incident to the execution of such papers shall be borne by the assignee, its successors and assigns.

I authorize my attorney(s), Joseph G. Curatolo,
to insert on this assignment the date of execution of said appli-
cation when known.

IN TESTIMONY WHEREOF, I have hereunto set my hand this
9 day of May, 1984.

Steven Charles Prie
(Signature of Assignor)

COUNTY OF CUYAHOGA)

STATE OF OHIO)

) ss.

Subscribed and Sworn to before me this 9th day of
May, 1984.

Susan Munding Frolo
Notary Public

(SEAL)

SUSAN MUNDING FROLLO Notary Public
STATE OF OHIO
My Commission Expires August 24, 1985

Witnesses:

Patricia A. Salvaggio